ROCK FRAGMENTATION ANALYSIS SYSTEM

ABSTRACT

A rock fragmentation analysis system is provided for analyzing blasted rock (or other fragmented particles) to assess quality of a blast for efficient processing of subsequent operations in a mine, a quarry, etc. The system includes a hardware system and an image processing system. The hardware system includes a camera and a lighting system. The lighting system illuminates an area of the mine, quarry, etc. where a load haul dump (LHD) vehicle passes through. Once the LHD vehicle passes through the illuminated area, the camera provides video signals of scoop-top view images of the LHD vehicle to the image processing system via known communication means, such as hard-wired and wireless. The image processing system receives the video signals, captures the scoop-top view images, evaluates the images for subsequent fragmentation analysis, and performs the rock fragmentation analysis. The image processing system performs these functions using several software modules. Two such software modules are the Fragmentation Scanning (FragScan™) and the Fragmentation Analysis (FragAnalysis™) software modules. The FragScan software module scans the video signals until it captures a valid image for analysis by the FragAnalysis software module. Once the FragScan triggers on the image, a raw image and other details corresponding to the captured image are buffered for subsequent rock fragmentation analysis by the FragAnalysis software module. The rock fragmentation analysis is designed to estimate the major diameter of each rock visible in the image. The overall size distribution of the rocks in the image is output by the FragAnalysis software module, and the corresponding input image and the binary blob image, i.e., the processed image, are stored by the image processing system.